Acute right intrathoracic gastric volvulus.
A rare surgical emergency

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Acute right intrathoracic gastric volvulus. A rare surgical emergency

The acute intrathoracic gastric volvulus is a rare condition, difficult to diagnose and treat. It consist in a abnormal organo-axial rotation over 180°, associated with gastric obstruction or strangulation. More uncommon condition is the gastric volvulus caused by a right sliding diaphragmatic hernia and dislocating the stomach, or part of it, on the right hemithorax. Gastric volvulus classic clinical presentation described by Borchardt, consist on a triad of severe epigastric pain, vomiting followed by retching without ability to vomit and difficulty or inability to pass a nasogastric tube.
Imaging, beginning from a simple chest radiograph showing an elevated gastric air-fluid level in lower lung segments, can help to define diagnosis and to determine the immediate necessity to operate trying to avoid fatal complications as gastric ischemia, perforation or haemorrhage. We present the case of a 58 year-old man arrived at our Emergency Department with moderate acute epigastric pain and already vomiting from 4 hours. The patient underwent initially a chest radiograph, Computed Tomography, upper digestive endoscopy, upper digestive contrasted radiology and then was operated. Post operative situation of the patient on recovery and during the 3 months follow up didn't experience any pain or difficulty in feeding.

KEY WORDS: Borchardt's triad, Diaphragmatic hernia, Gastric volvulus

Introduction

Mostly happening on the fifth decade of life, gastric volvulus consist in a rotation greater than 180° of the stomach, or parts of it. The most common type of rotation consist in the rotation along the longitudinal gastric axis.
Acute intrathoracic gastric volvulus occurs when the stomach undergoes organo-axial torsion in the chest due to an enlargement of the hiatus or a diaphragmatic hernia. This particular condition can occur also after surgical procedures on the upper abdomen, mainly after hiatal hernia repair. It is also found in literature described as iatrogenic diaphragmatic hernia associated with intrathoracic gastric volvulus after left nephrectomy [1], esophagogastrectomy [2] and splenopancreatectomy [3].
The clinical situation of the intrathoracic stomach combined with gastric volvulus are epigastric and lower chest pain, post prandial discomfort and dysphagia, initial vomiting followed by retching without ability to vomit, hemorrhage, retrosternal sense of fullness and anemia associated with inability or difficulty to pass a nasogastric tube.
This pathological condition is frequently diagnosed by imaging intrathoracic viscera and/or air-fluid levels in the chest radiograph; this can be followed by a upper oral contrast radiology or upper gastrointestinal endoscopy. Computed Tomography (CT) scan leads to immediate diagnosis with anatomical details. This condition is con-

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sidered life-threatening because delayed treatment may result in perforation, infarction or other lethal outcomes [4]. We will describe a rare case of an acute intrathoracic gastric volvulus located on right chest, due to right diaphragmatic hernia, occurring in a middle-aged man.

Case report

A 58 year-old man arrived at the Emergency Department of UHC "Mother Theresa" of Tirana with a 12 hours history of acute moderate epigastric pain and sense of retrosternal fullness. The patient reports about vomiting once and then retching without being able to vomit again. Physical examination showed diffuse tenderness, hyperactive bowel sounds and unventilated right lung basal segments. Abdominal ultrasound and electrocardiography were both unremarkable. It wasn't possible to pass a functional nasogastric tube.

On patients arrival blood pressure was 125/90 mmHg, heart rate was 92 beats per minute, respiratory rate was 15 times per minute, and body temperature was 36.8°C. Laboratory results were as follows: WBC 8,900/ l with 43% segmented neutrophils, BUN 56 mg/dl, creatinine 0.97 mg/dl, amylase 57 IU/l, lipase 12 IU/l, AST 45 IU/l and ALT 41 IU/l.

The chest radiograph demonstrated an elevated gastric air-fluid level in the right lower lung segments (Fig. 1). An urgent gastroduodenoscopy was performed demonstrating difficult passage over the gastro oesophageal junction, massive fluid collection below that point and inability to reach the duodenum due to a structural abnormality. The explored gastric mucosa was strongly hyperemic. A combined chest – abdominal CT scan demonstrated a distended stomach, located and rotated in the right lower hemithorax through a right diaphragmatic defect (Fig. 2). The correct diagnosis of right intrathoracic gastric volvulus through diaphragmatic hernia was confirmed by performing an upper gastrointestinal oral contrast radiograph (Fig. 3).

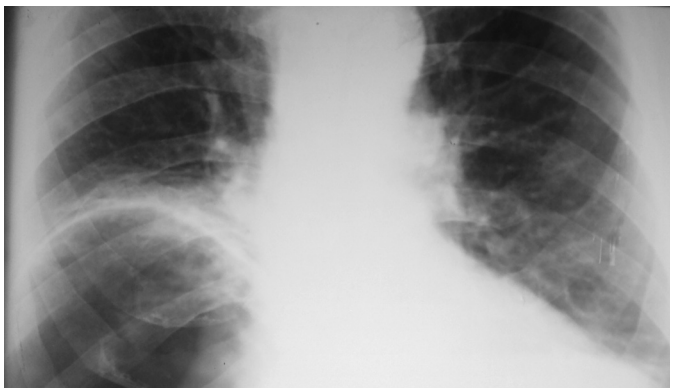

Fig. 1: Chest radiograph at admission shows a high gastric air-fluid level on the right lower lung segments and an elevated gastric contour.

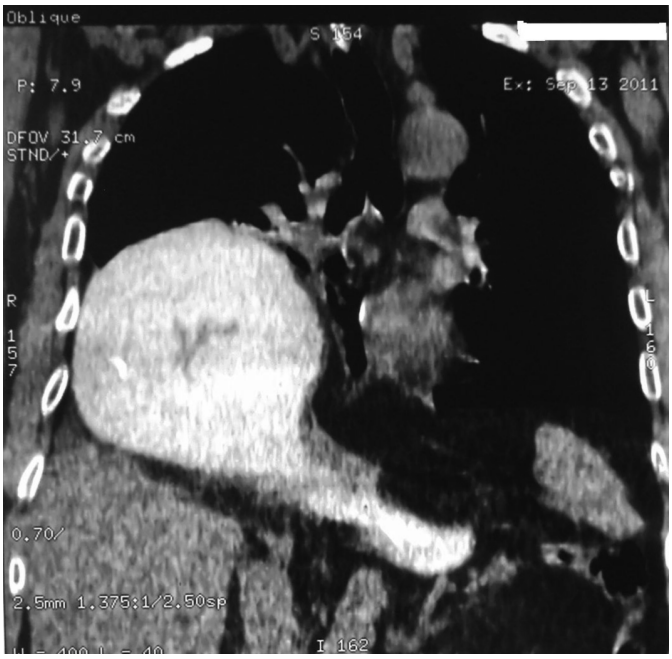

Fig. 2: Combined chest and abdominal CT scan demonstrated a distended stomach, located and rotated in the right lower hemithorax through a right diaphragmatic defect.

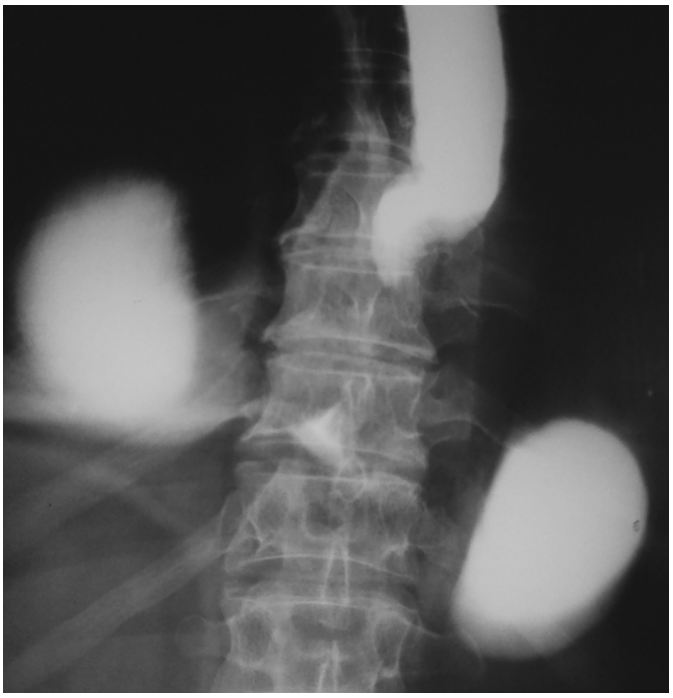

Fig. 3: The diagnosis of right intrathoracic gastric volvulus through diaphragmatic hernia, confirmed by performing an upper gastrointestinal oral contrast radiograph.

With this working diagnosis, emergent laparotomy was performed. The pyloric valve was rised in abdominal cavity up to the diaphragmatic level and the other parts of the stomach were found in the right lower thorax. We

found also adhesions between the diaphragm and herniated stomach. The herniated stomach was reduced into the abdomen, and following lysis of adhesions, the diaphragm was repaired performing a standard anti reflux procedure (Boix-Ochoa technique)[5].
The patient had a normal post operative recovery. The chest radiograph performed on 3rd post operative day showed minimal liquid in the basis of the right pleural space. Post operative situation of the patient on recovery and during the 3 months of follow up didn't experience any pain or difficulty in swallowing and feeding.

Discussion

Acute gastric volvulus located on the right hemithorax is a rare disease [4,6]. Gastric volvulus is a rare condition, since in our case it was located on the right hemithorax, diagnosis was made even more difficult [7]. Gastric volvulus is frequently associated with congenital abnormalities and congenital diaphragmatic hernia presenting in early childhood; that are the most common of these abnormalities [8]. Gastric volvulus may appear acutely with severe epigastric pain and distention, vomiting followed by retching with no vomit, and difficulty or inability to pass a nasogastric tube (Borchardt's triad), or with chronic mild abdominal symptoms. This patient had all these acute symptoms at presentation.
The diagnosis of gastric volvulus is usually made by radiological study, possibly using oral contrast. Radiological signs of gastric volvulus include a retrocardiac "double air-fluid level" on upright films [7]. This finding designates the abnormal rotation of stomach along its longitudinal (organo-axial) or transverse (mesentero-axial) axis. Gastric volvulus is treated by various surgical procedures, depending on the predisposing cause and the condition of the stomach at the time of operation.

Riassunto

Il volvolo gastrico intratoracico acuto rappresenta una condizione rara, difficile da diagnosticare e da trattare. Consiste in una rotazione organo-assiale di 180° che si associa a ostruzione gastrica o addirittura ad un strangolamento.
Una condizione ancora più rara è il volvolo gastrico provocato da un'ernia diaframmatica da scivolamento con dislocazione dello stomaco o di parte di esso nell'emitorace. La presentazione clinica classica del volvolo gastrico è quella descritta da Borchardt, e consiste in una triade: dolore epigastrico intenso, vomito seguito da conati senza vomito e difficoltà o impossibilità di passare un sondino naso-gastrico nello stomaco.
Lo studio per immagini, cominciando dal semplice radiogramma diretto del torace mostra un livello idro aereo di tipo gastrico in corrispondenza dei segmenti polmonari inferiori, può far sospettare la diagnosi ed indicare la necessità di un intervento immediato per tentare di evitare una catastrofe vascolare dello stomaco con danni ischemici, perforazione o emorragia.
Presentiamo il caso di un uomo di 58 anni giunto al Dipartimento di Emergenza con un dolore epigastrico ad insorgenza acuta ma di entità moderata, che vomitava già da 4 ore. Ad un iniziale radiogramma diretto del torace ha fatto seguito una CT, una endoscopia del tratto digestivo superiore ed un esame contrastografico esofago-gastro-duodenale e quindi portato al tavolo operatorio. All'intervento lo stomaco erniato è stato ridotto al di sotto del diaframma, che liberato dalle aderenze è stato riparato, confezionando un classic intervento antireflusso secondo la tecnica di Boix-Ochoa.
Nel postoperatorio immediato e nei tre mesi successivi il paziente non ha più sofferto di dolori o di difficoltà all'alimentazione.

References

1. Axon PR, Whatling PJ, Dwerryhouse S, Forrester-Wood CP: *Strangulated iatrogenic diaphragmatic hernia: A late diagnosed complication*. Eur J Cardiothorac Surg, 1995; 9:664-66.

2. Alrabeeah A, Giacomantonio M, Gillis DA: *Paraesophageal hernia after Nissen fundoplication: A real complication in pediatric patients.* J Pediatr Surg, 1988; 23:766-78.

3. Testini M, Vacca A, Lissidini G, Di Venere B, Gurrado A, Loizzi M: *Acute intrathoracic gastric volvulus from a diaphragmatic hernia after left splenopancreatectomy: Report of a case*. Surg Today, 2006; 36:981-84.

4. Maeng JH, Lee HS, Jang JG, Park BG, Nah BK, Kim YH, Jung SM, Cheon GJ: *Acute gastric volvulus due to diaphragmatic hernia*. Korean J Gastroenterol, 2003; 42:544-48.

5. Hernández-Orgaz A, López-Alonso M: *Surgical treatment of the GER with Boix-Ochoa technique. Long term results*. Cir Pediatr, 2004; 17(3):122-24.

6. Wasselle JA, Norman J: *Acute gastric volvulus: pathogenesis, diagnosis, and treatment*. Am J Gastroenterol, 1993; 88:1780-784.

7. Hyung HK, Seun JP, Moo IP, Won M: *Acute intrathoracic gastric volvulus due to a diaphragmatic hernia: A rare emergency easily overlocke*d. Gastroenterol, 2011; 5(2):272-77.

8. Cunniff C, Jones KL, Jones MC.*Patterns of malformation in children with congenital diaphragmatic defects*. J Pediatr, 1990; 116:258-61.